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Authors of papers intended for publication in Food Technology should request from the Editor's office a copy of a booklet, titled "Suggestions to Authors," and see that their papers are in the form specified therein before they are sent to the editor.

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*The experiment is under the joint auspices of the Williams-Waterman Fund, Republic of the Philippines Department of Health, United States Public Health Service Rehabilitation Program, National Rice and Corn Corporation of the Philippines and Hoffmann-La Roche Inc. Preliminary reports published thus far have appeared in the Journal of Nutrition of August 1949, Journal of the Philippine Medical Association, November 1949, and the Rice Journal of April, 1950.

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Regional Section News

ST. LOUIS SECTION

The March meeting was held on the 21st at the St. Louis Dairy Co. Fred Linde, Chairman of the Section, and Chemical Engineer with Monsanto, spoke on the use of the newer agricultural chemicals.

PHILADELPHIA SECTION

The March meeting was held on the 22nd at Brewery Tavern. Lloyd E. Partain, Manager, Commercial Research Division, Curtis Publishing Co., Philadelphia, spoke on "Determining Consumer Preference." Mr. Partain discussed sampling techniques and criteria for questions to fairly determine consumer preference. Drawing from his own experience, he told of methods of determining likes and dislikes of consumers on such qualities as color of packages to the salt on a pretzel.

NORTHEAST SECTION

On February 2, the Section held a dinner meeting in Boston. This was followed by colored, silent film depicting the new bread baking installation of the First National Stores at Portland, Maine. The film was accompanied by a running commentary by James Mullen, Superintendent of the bread bakery, First National Stores, Somerville, Mass.

The main address of the February meeting dealt with the "History of the Development of Cake Production in the Baking Industry." Charles Glabau, vice president of *Bakers' Weekly* was the speaker and illustrated his take with slides.

On March 2, there was a dinner meeting at the Graduate House, M. I. T. Previous to the main address of the evening, the annual business meeting was held at which the following officers were elected for the coming year:

Chaiman: N. R. Cole, Walter Baker Division, General Foods Corp., Dorchester, Mass.
Vice Chairman: J. J. Austin, Austin Industries, Sudbury, Mass.
Treasurer: L. B. Sjöstrom, Arthur D. Little Co., Inc., Cambridge, Mass.
Secretary: C. H. Shackelford, Great Atlantic and Pacific Tea Co., Boston, Mass.
National Councilors: E. C. Peakes, New England Confectionery Co., Cambridge, Mass.; H. P. Bowra, Fritzsche Bros., Inc., Boston, Mass.

The main address of the March meeting was given by Thomas Rector, Vice President in Charge of Research and Development, General Foods. His talk "The Food Technologists' Contribution to Advancement in the Food Industry" was enjoyed by a large group of members and students.

It is planned to hold the spring meeting at the University of Massachusetts, Amherst, on May 6th. At this meeting the main address will be given by Shelby Grey, Chief of the Boston District of the Pure Food and Drug Administration. Subject: "The Pure Food Inspector, What He Looks For, and What He Finds." It is planned to show several films of industrial opera-

You are cordially invited TO VISIT US AT OUR EXHIBIT, BOOTH 32, IN THE FOOD TECHNOLOGISTS SHOW AT EDGEWATER BEACH HOTEL, CHICAGO, MAY 21 TO 25, 1950.

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tions, including the new technicolor of "Necco Operations" (confectionery manufacture), "Time and Tide" (depicting fishing operations out of the port of Boston), and "Shrimp Operations off the Shores of Louisiana and Texas."

Requests for sponsorship by the Section have been received from members of two groups of food technology students: those at the University of Massachusetts and those at the Massachusetts Institute of Technology. This sponsorship has been approved by the Section. These two groups have also applied for recognition as student chapters of the National I. F. T.

The Samuel Cate Prescott Chapter of food technology students met on March 20th at M. I. T. to hear W. L. Campbell, Head of the Department of Food Technology at M. I. T. Professor Campbell impressed on the students the desirability of joining the Institute of Food Technologists, and gave advice on showing sincere interest in their work when they go out into the business world. The president of this chapter is Pressley W. Jones, Jr., and Secretary-Treasurer is Miss Margaret E. Irby.

SOUTHERN CALIFORNIA SECTION

The March meeting was held on the 15th at the Laboratory of Fruit and Vegetable Chemistry, Bureau of Agricultural and Industrial Chemistry, U. S. D. A., Pasadena. The building housing this laboratory is just about a year old, and dinner was served by a caterer in the spacious pilot plant of the laboratory. Prior to the meeting, a tour was made of the laboratory. After this, E. A. Beavens, Director of the Laboratory, outlined the work carried on there and called on members of the laboratory staff to discuss some of the main projects in progress.

Funds for building of this very fine structure was provided under the Research and Marketing Act of 1946. The laboratory replaces the Bureau's old research station on Mission Road, Los Angeles which has furnished in rented quarters valuable research service to fruit and vegetable industries of this region during the past 37 years. Mr. E. M. Chace, now retired, was the first director of the old Los Angeles research station.

OREGON SECTION

The first annual meeting of the Section was held in the Public Library, Portland, on March 11th. Speakers on the afternoon program were E. C. Bubl, Agricultural Chemistry, and K. Duggan, Department of Food Technology, both of Oregon State College; A. F. Bucholtz, Sick's Breweries Laboratories, Seattle; Richard Edge, Food and Drug Administration, Portland.

At the evening banquet, Dr. A. L. Strand, President, Oregon State College, spoke on "Insect Problems in the Milling Industry."

The business meeting resulted in the election of the following officers for 1950:

Chairman: J. Spencer George, Tillamook, Oregon
Vice Chairman: G. A. Richardson, Corvallis, Oregon
Secretary-Treasurer: C. E. Samuels, Dept. Food Technology, Oregon State College, Corvallis, Oregon

E. H. Wiegand, Councilor, and C. L. Beardsley, K. P. Fenner, E. M. Litwiller and E. I. Pitkin comprising the Executive Committee, continue in office.

The student group, now consisting of 45 members, reported an active program, an accepted constitution and by-laws and a full slate of officers.

The next meeting of the Section will be held early in May at Salem.

AMES SECTION

The March meeting was held on the 29th when Dr. Gail M. Dack spoke on "Food Borne Infections" and "Staphylococcus Food Poisoning." Dr. Dack is Director of the Food Research Laboratory, University of Chicago. At present he is associated with the Office of Scientific Research and Development. Dr. Dack's work on food borne infections is well-known as is also his book "Food Poisoning."

Prior to the meeting there was a dinner in the Oak Room at Memorial Union.

MARYLAND SECTION

A new approach to a pleasant meeting was tried out at the March meeting of the section (details of the March meeting were given in the April issue of FOOD TECHNOLOGY.) This new idea, suggested by Dr. Clark, consisted of the serving of preserves and exotic spices, and specially decorated ice cream provided by Crosse and Blackwell and Hendler's Creamery in Baltimore. Dr. Clark suggests that perhaps other sections would like to liven up the bill of fare by having some of the companies represented in their roster provide some of their products.

GOLDEN TRIANGLE PIONEERS

The possibility of organizing a local food group made up, of food men in the area of western Pennsylvania, eastern Ohio and West Virginia is being investigated by a committee consisting of H. N. Riley, Executive Vice President of H. J. Heinz, A. J. Claxon, President, Meadow Gold Dairy, Inc., D. M. Gray, Vice President, Stone-Mudge, Inc., H. H. Mottern, Director of Research, H. J. Heinz, H. E. Longenecker, Dean, Graduate School, University of Pittsburgh, and Fred C. Blanck, Administrative Fellow, Mellon Institute.

A meeting to ascertain the sentiment in the area specified on the advisability of perfecting a local organization was called for March 2nd at the Mellon Institute. Should such a group become born, it is planned to hold three or four meetings a year. At a later date the local organization could become a duly organized regional section of the Institute of Food Technologists.

HONORS

C. R. Fellers to Receive Babcock Award

Dr. Charles N. Frey, Acting Chairman of the Babcock Award Jury, announced today that Dr. Carl R. Fellers, President of the Institute of Food Technologists and Chairman of the Department of Food Technology of the University of Massachusetts, has been selected as the 1950 recipient of the Babcock Award. This award, consisting of a medal and a $1,000 honorarium has been provided by the Nutrition Foundation whose scientific

(Continued on page 8)

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Regional Section News

(Continued from page 6)

director, Dr. Charles G. King, will make the presentation at a noon luncheon on May 22, 1950, of the Institute of Food Technologists' Decennial Conference at the Edgewater Beach Hotel in Chicago.

Borden Award to G. Arthur Richardson

G. Arthur Richardson, Professor, Dairy Husbandry, Oregon State College, Corvallis, Oregon, received the $1,000 Borden Award in the chemistry of milk for his outstanding contributions to the knowledge of the physico-chemical properties of milk. The award was presented on the evening of April 10 at the Bellevue-Stratford Hotel during the Philadelphia session of the American Chemical Society's 117th National meeting. Professor Richardson's award address was "Some Dynamic Properties of Milk."

Professor Richardson was born at Stirling, Ontario, Canada, July 26, 1893 and received his B.Sc. (Agr.) from the University of Toronto in 1920. In 1923 he entered the University of Minnesota for graduate work under the late L. S. Palmer, receiving his M.S. in 1925 and his doctorate in 1927.

He married Mary Hall of Alberta, Canada in 1926. They have two sons: Campbell, who is at Dartmouth, and Robert, attending Corvallis High School.

Professor Richardson is also vice-chairman of the Oregon Section of IFT.

Those who wish to know what some one with a thousand bucks looks like, see the cover of the March 13th issue of *Chemical and Engineering News*.

PERSONNEL

J. J. Austin, Secretary of the Norteast Section for many years, and the newly elected vice-chairman, has recently returned from a siege at the New England Baptist Hospital. It is hoped he will have a rapid recovery.

Eleanor O. Barnes, formerly professor, Syracuse University, College of Home Economics at Syracuse, N. Y., now holds a similar position at the University of Arkansas, Fayetteville.

Clarence W. DuBois, formerly with D. K. Tressler & Associates, Westport, Conn., is now connected with Minute Maid Corp., Plymouth, Florida, one of the large producers of frozen orange concentrate.

Our IFT President, Carl R. Fellers was on active military duty two weeks in March at the Pentagon Building. And that's enough to confuse any one.

Vernon H. McFarlane, recently carrying on post graduate work at the University of Wisconsin, is now head of the Biochemical Section of the Protein and Carbohydrate Division at the Southern Regional Research Laboratory, New Orleans, La.

E. F. Kohman, with Mrs. Kohman, left in March for a six weeks trip to Mexico.

Dean Samuel C. Prescott, founder of the IFT, and Professor Emeritus of Industrial Biology at the Massachusetts Institute of Technology, was away from Boston this past winter for about a month on a trip to the West Coast. While in Los Angeles, he had the opportunity of attending the Fourth All-Day Conference of the California Section of IFT at which he made a few remarks. In Berkeley, California, he saw a number of the members of the Northern California Section and spent some time at the Refrigeration Research Foundation there. Upon his return to Boston, he reported to the Northeast Section at its March meeting on the wonderful success of the Los Angeles All-Day Conference. The Dean certainly gets around.

B. E. Proctor, Director of the Samuel Cate Prescott Laboratories of Food Technology, Massachusetts Institute of Technology, explained and demonstrated the results of experiments on processing and refrigeration of foods, on the *Boston Post* television show "At Home with Mildred Carlson," on February 28th, over WBZ-TV, Channel 14. Professor Proctor mentioned the $1,000,000 gift of the Campbell Soup Co., to M. I. T. which will be used to support M. I. T.'s research program in biology, food technology, and related scientific and engineering fields. As part of its development program, M. I. T. will erect a new building to house the Departments of Biology and Food Technology. The building will be named in memory of John Thompson Dorrance, M. I. T. '95, who was President of the Campbell Soup Co., from 1914 until his death in 1930.

L. B. Sjöstrom and E. C. Crocker attended a conference at the Bureau of Human Nutrition and Home Economics in Washington, D. C. January 23-26. Subject of the conference: "Methodology in Palatability Testing."

Necrology

Thomas M. Rector, Vice President in charge of research and development of General Foods Corporation, who was chosen to receive the Nicholas Appert Award of the Chicago Section of IFT in 1950, died suddenly on April 1st in Battle Creek, Michigan. Mr. Rector was born in Warrenton, Va. in 1894 and when but 17 years old, and fresh from high school, became assistant chemist for the Institute of Industrial Research, four years later becoming chief chemist for Pompeian Olive Oil Co. where he remained for two years. He built up his experience and knowledge by working in several other laboratories before joining General Foods in 1927 as a chemical engineer. In 1943 he became vice president in charge of research and development. Mr. Rector had the distinction of reaching the top in the chemical profession without a college degree.

The Institute and the food industry have suffered a great loss in the passing of Mr. Rector.

NOTICE—ALL MEMBERS

All members who possibly can should attend the general session Monday morning, May 22nd, at the Tenth Annual Convention because important constitutional changes will be presented for consideration.

Committee on Constitution.

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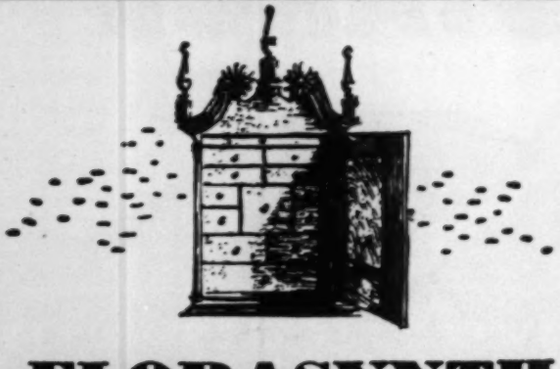

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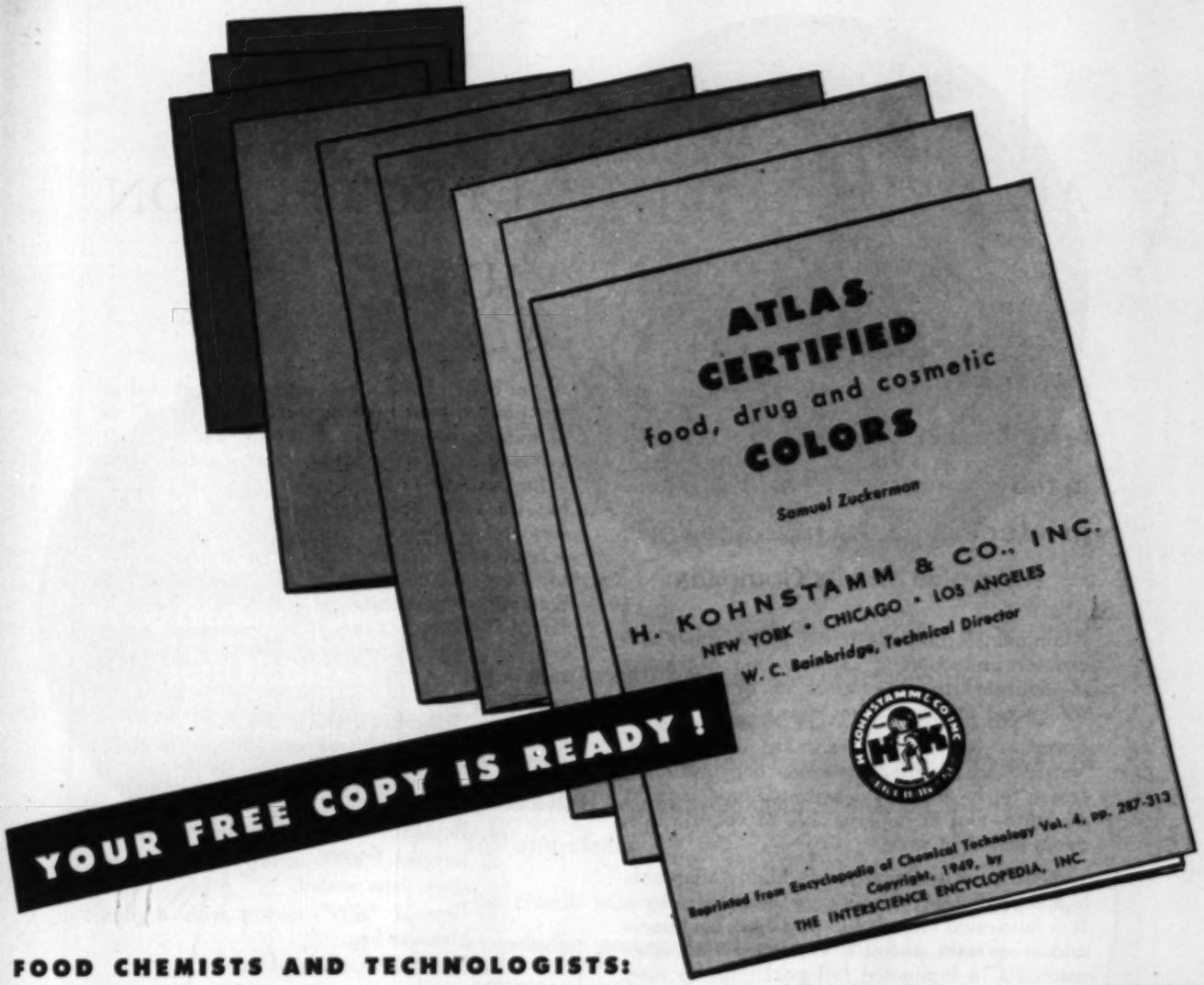
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PRODUCT: A packaged pudding mix.

CONDITIONS: Six weeks at 100° F., 80-85% relative humidity.

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1. Reyseal "509" carton without liner.
2. Reyseal "509" carton with glassine liner, heat sealed.
3. Reyseal "509" carton with duplex glassine bag.
4. Non-foil carton and liner.

RESULTS: Product in Package 2 maintained freshest odor and best color at end of test period. Cooking tests showed product in Package 2 to be superior in flavor and texture. Package 2 provided six times more protection against moisture than Package 4; Package 3, one and three-fifths times more. Package 1, without liner, proved superior to Package 4, but the differential was naturally less.

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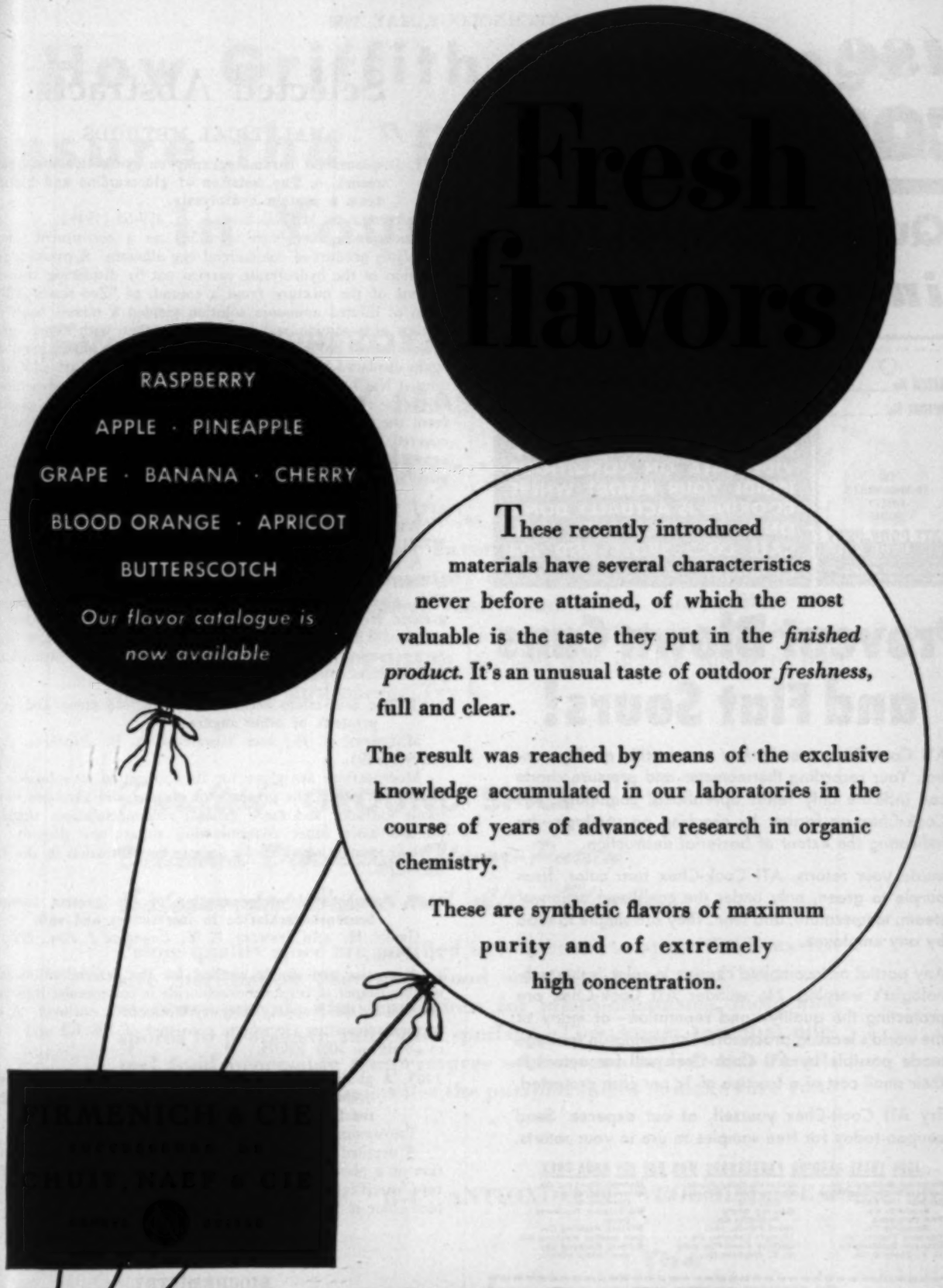
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Selected Abstracts

ANALYTICAL METHODS

116J. Displacement chromatography on synthetic ion-exchange resins. 4. The isolation of glucosamine and histidine from a protein hydrolysate.

PARTRIDGE, S. M. *Biochem. J., 45,* 459-63 (1949).

Glucosamine has been identified as a constituent of the hydrolysis product of commercial egg albumin. A primary fractionation of the hydrolysate carried out by displacing the components of the mixture from a column of "Zeo-Karb 215" by mean of diluted ammonia solution yielded a mixed band containing glucosamine and histidine together with other amino-acids in small amount. The components of the mixed band were again displaced from a smaller column of "Zeo-Karb 215" using diluted NaCl recovered in a pure condition as the hydrochloride. Histidine remained in the column. The histidine was displaced from the column by means of ammonia solution and was recovered as the free base in a substantially pure condition. The principle underlying the separation is discussed briefly and possible application to other systems are pointed out.

117J. The micro-estimation of citric acid.

WEIL-MALHERBE, H., AND BONE, A. D. *Biochem. J., 45,* 377-81 (1949).

A modification of the colorimetric estimation of citric acid is described in which permanganate is replaced by vanadic acid. This gives increased simplicity and speed of operation, and greater freedom from interference by other oxidizable substrates. The yield of pentabromoacetone is almost quant. Some recent modifications of the colorimetric estimation of pentabromoacetone are critically examined.

118J. The semi-micro estimation of lactose alone and in the presence of other sugars.

MALPRESS, F. H., AND MORRISON, A. B. *Biochem. J., 45,* 455-9 (1949).

Modifications are given for its application to solutions containing lactose in the presence of glucose and glycogen, and in tissue extracts, and more general recommendations made for its use when other contaminating sugars are present. The method is most sensitive for lactose concentration in the range 0.05-0.2%.

119J. Polarographic determination of the gamma isomer of benzenehexachloride in insecticides and soil.

GRASS, H., AND SPENCER, E. Y. *Canadian J. Res., 27F,* 368-71 (1949).

A precise and simple method for the determination of the gamma isomer of benzenehexachloride in commercial insecticides and soil by the dropping mercury electrode is outlined. A satisfactory supporting electrolyte consisted of 1% KI and a trace of gelatin in 50% EtOH.

120J. A photoelectric spectrophotometer suitable for the measurement of vitamin A by the antimony-trichloride reaction.

THOMPSON, S. Y. *Brit. J. Nutr., 3,* 43-50 (1949).

A detailed description is given of the setting up and calibration of a photoelectric spectrophotometer of the direct reading type specifically designed for the measurement of the fleeting blue color in the antimony-trichloride reaction for vitamin A.

BIOLOGICAL SCIENCES

BIOCHEMISTRY

121J. The "browning" reaction of proteins with glucose.

MOHAMMAD, A., FRAENKEL-CONRAT, H., AND OLCOTT, H. S. *Arch. Biochem., 24,* 157-78 (1949).

The reaction of proteins, protein derivatives, and model substances with glucose solutions has been studied in detail. The rate of browning is proportional to the temperature and pH. The free amino groups are the primary site of the reaction.

(Continued on page 16)

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Abstracts

(Continued from page 14)

They decrease as the reaction proceeds, and if they are masked, as by acetylation, no browning occurs at or below 53° C. Guanidyl groups are involved secondarily, but not amide groups. Tryptophan, and possibly histidine and tyrosine, is also affected. The browned derivative of bovine serum albumin has been characterized in detail by electrophoretic, ultracentrifuge, osmotic-pressure, amino acid analyses, and other technics.

122J. The basic amino acid contents of collagen and of deaminized collagen.

SALO, T. P. *Arch. Biochem., 24,* 25-30 (1949).

Arginine and histidine were redetermined in a number of different collagens. A redesigned test for arginine (chem., colormetric) is described. Deamination causes a 40% loss in total basic amino acid content with some destruction of arginine and histidine. The total basic amino acid content of mammalian collagen does not vary significantly.

123J. A new lyophilizing apparatus.

STULL, J. W., AND HERREID, E. O. *J. Dairy Sci., 32,* 973-6 (1949).

A lyophilizing apparatus is described in which the design, simplicity, and efficiency represents improvements in the types of apparatus available for small scale operation. Construction and operation are described.

MICROBIOLOGY

124J. Some studies on the survival of Escherichia coli in milk and other dairy products.

J. Milk Food Tech., 12, 317-24 (1949).

Escherichia coli will grow at 10° C. more in the warm summer months than in the winter months. A higher count and a longer survival of *E. coli* was obtained in chocolate milk and cream than in the other types of milk tested. The survival of *E. coli* depends on the storage temperature. (The higher the temperature the more the growth and the shorter the survival time.) *E. coli* still existed in large numbers for many days in milk that had passed the point of being used for food.

125J. Food preservation with antibiotics.

Info. Letter, No. 1268, 2, Jan. 7, 1950.

A new method of food preservation, using antibiotics has been announced by the USDA Bureau of Agricultural and Industrial Chemistry. Canned vegetables are sterilized by adding very small amounts of an antibiotic and then giving the sealed cans a relatively mild heat treatment. Studies so far show that canning vegetables with antibiotics, compared with ordinary canning, permits sterilizing the cans with heat more rapidly, at lower temperatures and without pressure-cooking equipment. The antibiotics used do not affect the taste of the food and the final products have better flavor than conventionally canned vegetables. In most of the tests so far the antibiotic used is subtilin, which is produced in submerged fermentation by one strain of a bacterium *(Bacillus subtilis)* which occurs widely in nature and normally exists in many food products. Peas, asparagus, and corn are the vegetables used in the studies, but preliminary work has also been done on corn, green beans, peeled potatoes, tomato juice, and milk.

NUTRITION

126J. The effect of cocoa upon calcium utilization and requirements, nitrogen retention, and fecal composition of women.

BRICKER, M. L. et al. *J. Nutr., 39,* 445-61 (1949).

The effect of the ingestion of a moderate-cost American process cocoa on calcium utilization was studied in 8 college women, 18 to 22 years of age. Five levels of cocoa (5.6, 21.0, 28.5, 34.8, 56.2 grams) were tested, 4 diets containing milk as the major source of calcium and the other in a milk free diet. No statistically significant differences were demonstrated between the calcium balances of subjects on non-cocoa diets and those of the same subjects on cocoa diets. The average daily calcium requirements for all subjects were 686 ± 52 mg. on cocoa and 669 ± 42 mg. on non-cocoa diets, or for an average 11.8 ± 0.5 mg. per kilogram of body weight. It was concluded that the tolerance of the subjects of this experiment for cocoa of the grade used was approximately one ounce daily.

127J. The nutritive value of canned foods. I. Amino acid content of fish and meat products.

DUNN, M. S. et al. *J. Nutr., 39,* 177-85 (1949).

Seventy-four individual samples were assayed for 10 essential amino acids. It was established that the sample preservation processes and the microbiological procedures employed were adequate. The distribution of the amino acids in the canned fish and meat products were generally uniform. None of the amino acids determined was significantly altered by heat processing.

128J. The nutritive value of canned foods. II. Amino acid content of fish and meat products.

NEILANDS, J. B., et al. *J. Nutr., 39,* 187-202 (1949).

The essential amino acid composition of the various species of fish investigated was found to be in fair agreement with that found by earlier workers, although some differences are noted and discussed. Excellent agreement was found with respect to the 41 samples which were assayed in both laboratories. This comparison gives evidence of the reliability of the microbiological assay technic for amino acid analysis. Heat processing as employed in canning did not change materially the essential amino acid composition of the various fish and meat samples assayed.

129J. Nitrogen balance in men consuming raw or heated egg white as a supplemental source of dietary protein.

SCUDAMORE, H. H., et al. *J. Nutr., 39,* 555-65 (1949).

Heated commercial egg white was better utilized than unheated commercial egg white, which in turn was better utilized than lactalbumin. It was concluded that egg white anti-trypsin exerts very little deleterious effect upon nitrogen balance in man under the conditions of the experiment.

130J. The effect of storage on the nutritional qualities of the proteins of wheat, corn and soybeans.

MITCHELL, H. H., AND BEADLES, J. R. *J. Nutr., 39,* 463 84 (1949).

The effect of storage at approximately 78° F. and at moisture contents of 6 to 12% for periods of from 730 to 1,020 days on the nutritive value of the proteins of wheat, corn, and soybeans was determined. Soybeans stored for 1,020 days as raw, whole beans, deteriorated definitely and significantly in both the digestibility and biological value of their protein. Neither the corn nor wheat were at all affected by the storage. The difference in response to storage between the two types of seeds may reside largely in the fact that the living part of the seed, the embryo, constitutes only a small part of the seed but a predominant part of the legume.

131J. Vitamin A utilization studies. I. The utilization of vitamin A alcohol, vitamin A acetate and vitamin A natural esters by the chick.

WEEK, E. F., AND SEVIGNE, F. J. *J. Nutr., 39,* 233-50 (1949).

Wide variations in the storage of vitamin A in the livers of chicks were found depending on the form of vitamin A fed and on the character and quantity of diluent. Importance was demonstrated of factors affecting the hydrolysis of vitamin A esters in vitamin A utilization. Carriers found to inhibit by hydrolysis were: jojoba seed oil, ethyl laurate, basking shark liver oil, mineral oil, cotton seed oil and corn oil. Sardine oil interfered with the hydrolysis of natural A esters, but not with vitamin A acetate.

132J. Vitamin A utilization studies. II. The utilization of vitamin A alcohol, vitamin A acetate and vitamin A natural esters by the rat.

WEEK, E. F., AND SEVIGNE, F. J. *J. Nutr., 39,* 251-7 (1949).

The relative biological efficiency of the three forms of vitamin A varied greatly depending on the nature and quantity of the diluent. The utilization of the three forms under identical conditions also varied greatly.

(Continued on page 20)

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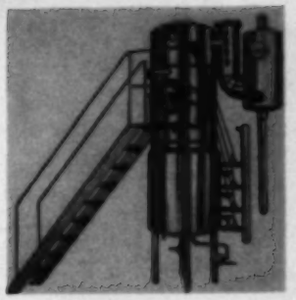

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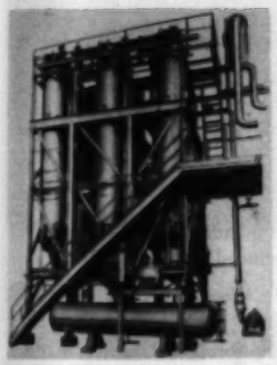

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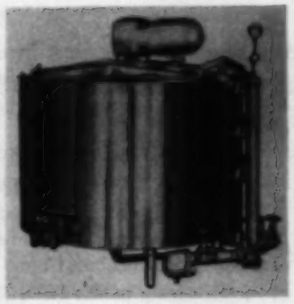

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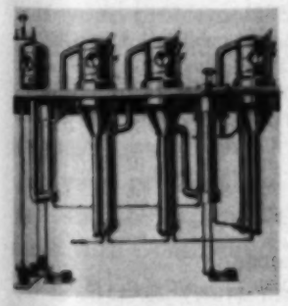

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Abstracts

(Continued from page 16)

133J. The vitamin A requirement of growing turkeys.
WHARTON, F. D. et al. *J. Nutr., 39,* 543-54 (1949).
It is concluded on the basis of the growth data, plasma levels and liver storage of vitamin A, that the vitamin A requirement of growing turkeys is 1,700 I. U. of the vitamin per 100 gm. of feed.

134J. What supplements to soybean oil meal are necessary for poultry.
CARRICK, C. W. *Soybean Dig., 10,* 24, Dec. 1949.
Inferior results in raising poultry on soybean oil meal were not due to its protein quality but to its vitamin and mineral deficiencies. These deficiencies may be easily corrected by the use of fermentation residues, or small amounts of meat or fish products. The factors usually absent from a soybean oil meal base ration are riboflavin, pantothenic acid, niacin, choline, and certain hatchability factors.

135J. The minimum riboflavin requirement of the infant.
SYNDERMAN, S. E., et al. *J. Nutr., 39,* 219-32 (1949).
An intake of 0.4 mg. of riboflavin per day by the infant served to maintain adequate blood levels, to maintain the urinary excretion at the upper limit of the zone of minimum excretion and was not associated with clinical evidences of deficiency.

136J. Growth failure in school children as associated with vitamin B_{12} deficiency—response to oral therapy.
WETZEL, N. et al. *Science, 110,* 651-3, Dec. 16, 1949.
Oral feeding of vitamin B_{12} showed marked growth response in 5 of 11 children.

137J. Succinylsulfathiazole and a rat growth factor in liver.
JONES, J. H., ROGERS, C. S., AND STONE, C. H. III. *J. Nutr., 39,* 579-90 (1949).
Young rats on a synthetic diet containing purified casein and all members of the vitamin B group except folic acid and vitamin B_{12} grew well. The addition of succinylsulfathiazole produced failure of growth, leukocytopenia, and finally death. The inclusion of folic acid in the succinylsulfathiazole diet corrected the blood picture and prevented the death of the animals, but failed to restore normal growth. The addition of crude liver extract to the animals given the succinylsulfathiazole gave them normal blood and they grew at a rapid rate. The subcutaneous injection of 0.02 ml. of a purified antipernicious anemia liver preparation in rats in the succinylsulfathiazole diet produced very good growth.

DETERGENTS

138J. Synthetic detergents.
WADDAMS, A. L. *Chem. and Ind., No. 46,* 783-8 (1949).
A review paper including: (1) Fundamental aspects of surface activity. (2) Commercial types of surface-active agents according to functionality. (3) Factors which effect detergency. (4) Mechanism of detergent action. (5) Methods of improving detergency effects on cotton and linens through the use of builders. (6) Industrial applications of synthetic detergents.

139J. Theoretical considerations of detergency.
GOETTE, E. K. *J. Colloid Sci., 4,* 459-84 (1949).
Solid particles are more difficult to remove than oily and fatty dirts. In the case of solid dirts, the smaller the particle size, the more difficult is the removal of the dirt, whereas, in the case of oily soils, the surface-active products cause droplet formation followed by soil removal. Looking at a homologous series of any soap, with increasing C-number, the optimum wetting action will be reached earlier than the optimum washing action. Branches in the paraffin chain shift both optima to a higher C-number. In this case, the absolute value for the wetting action will be increased. A second hydrophilic group in the detergent reduces both wetting action and cleaning action. The C. M. C. of anionic soaps and electroneutral soaps are reviewed because numerous soap properties show a break at or near the C. M. C. There is a break in the detergency curve which is in agreement with the C. M. C. in those cases where the full detergent power is utilized and where the dirt is not of an extremely small particle size. Furthermore, of practical interest is the break in the curves of surface activity, foam characteristics and solubility of oils and Ca-soaps at the C. M. C. In the presence of electrolytes, C. M. C. and critical washing concentration are not necessarily the same. Of basic importance in understanding the detergent action of soap and washing alkalies, are the interfacial potentials between the soiled surface, the dirt and the aqueous solution. The kind and the degree of these potentials are dependent on the ions of soap aggregates which are adsorbed preferentially by dirt and substratum. The loosening of the dirt from the substratum takes place because the detergent, due to its polar construction, goes between the dirt and the substratum. Electrostatic forces are the influencing factors which cause the loosening of the dirt; this process will be supported by mechanical movement. In general, the dirt cannot be removed if cationic soaps are used in low concentrations because the surface-active ions produce a positive charge on the dirt. But a cleaning effect with cationic soaps is possible if their concentration is high enough to give the substratum surface a positive charge. The cleaning activity of neutral or alkaline salts is dependent on the charge of their anions. Salts with multivalent cations decrease the cleaning action, because the preferentially adsorbed cations give a positive charge to the dirt as with cationic soaps. At high salt concentrations, agglomeration of the dirt takes place and the pH value also has a very important influence on the cleaning action. Therefore, cleaning action with salts present is dependent on the amount of salt and the kind and degree of charged ion preferentially adsorbed by the dirt and substratum. The increase in cleaning action with concentration of pure soap solutions below the C. M. C. can be explained by the increase in valence of the aggregation soap ions before the C. M.C. is reached and the formulation of micelles takes place.

FOOD PRODUCTS

BAKERY PRODUCTS

140J. Better cake and bread.
DAVIS, D. C. *Sci. N. L., 56,* 387 (1949).
A new process for flash-drying flour developed at the Industrial Research Institute, University of Denver, reduces moisture in flour to any level desired without damaging it. By whirling flour in a stainless steel cone in a stream of heated air, it loses from 50 to 90% of its moisture in 2 to 10 seconds. The dried flour is suitable for long storage.

141J. Cake as food.
FULLER, C. H. F. *Chem. and Ind., 45,* 771-2, Nov. 5, 1949.
Cake is defined as a baked food prepared from flour, sugar, water and one or more of the ingredients, fat, eggs, fruit and milk. Graphs are included to show the relative content of vitamins, fat, protein, carbohydrates and iron in cakes, bread, biscuits, eggs and milk. Conclusions drawn from this survey show that, while cake is not a protective food, it can play an important role in nutrition as an energy-producing food with high caloric value and provide a useful means of distributing meager amounts of eggs and fat.

FATS AND OILS

142J. Fat synthesis by micro-organisms and its possible applications in the food industry.
LUNDIN, H. *Chem. and Ind., 50,* 872 (1949).
By aerated cultivation of the type employed in the manufacture of baker's yeast or *Torulopsis utilis* (protein yeast) and employing a special fat-producing micro-organism, *Rhodotorula gracilis* (fat yeast) it is possible to product a cell substance containing 64% fat, dry basis.

143J. Antioxidant properties of polyhydroxybenzoic acids and their esters, and other nuclear substituted polyphenols.
MORRIS, S. G., AND RIEMENSCHNEIDER, R. W. *J. Am. Oil Chem. Soc., 26,* 638-44 (1949).

(Continued on 3rd cover)

Book Review

LABORATORY MANUAL AND WORK BOOK IN MICROBIOLOGY OF FOODS, by Fred W. Tanner, Ph.D., D.Sc., Professor of Bacteriology, University of Illinois. The Garrard Press, Champaign, Illinois. 386 pages. Price $4.75 without binder, $8.25 with durable binder.

Dr. Tanner's manual contains many official methods of food analysis, and assembles for the student and food technologist a tremendous amount of useful data. This is the most complete book of its kind and the first comprehensive book in the field. The methods cover much more than bacteriological examinations and include the tests used every day in industrial food laboratories.

The book is arranged so that each food is treated as a unit. References are made to Standard Methods for many foods, as well as to the literature of food microbiology and useful standard reference books. In the first five chapters, Dr. Tanner deals with food laws, postal laws, sanitation, microbiological methods, and the bacteria, yeasts and molds. Useful and complete laboratory methods are given for dairy foods — milk, butter, cheese, ice cream and miscellaneous dairy products — as well as eggs and meats. The subject of canned foods is treated very ably in 16 sections. The methods described for seafoods, frozen foods, tomato products, sugar, starches, flour, bread, spices, flavorings, condiments, nut meats and dried foods are complete and authoritative.

Most industrial laboratories have their method books covering techniques for examination of their special products. So far as this reviewer is aware, Dr. Tanner's manual and work book may well supplant many of them.

Teachers of microbiology of foods will find that the manual is well suited for their purpose because the subject matter deals with the actual examinations as carried out daily in industrial laboratories. The student pursuing this course can see that his professional training has started.

We are all fortunate that we may profit from Dr. Tanner's long experience and outstanding work in the food field. The manual will undoubtedly be widely used.

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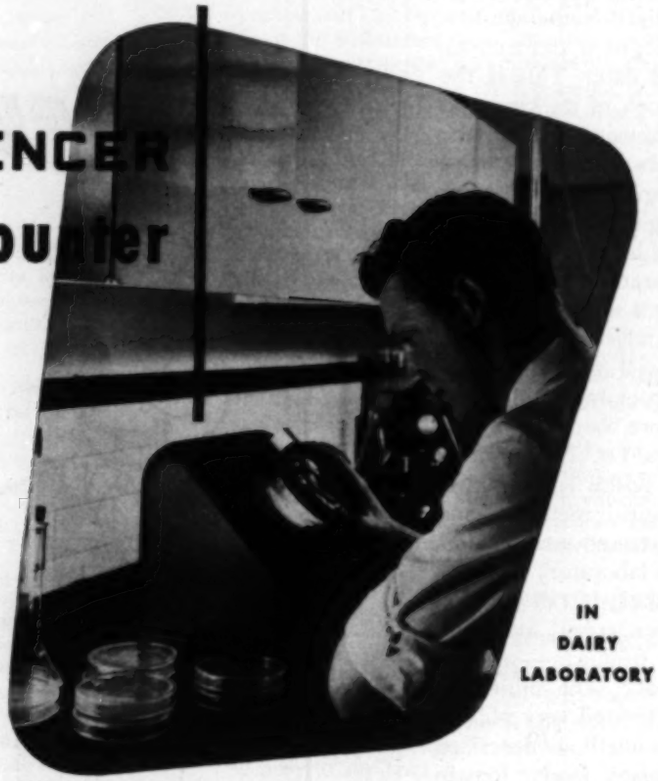

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Abstracts

(Continued from page 20)

Using the active oxygen and baked cracker tests, the classes of compounds had the following ascending order of activity, acyl phenols, polyhydroxybenzoic acid esters, phenols and several alkyl catechols.

FISH AND SEAFOOD

144J. The effect of mechanical washing of fish on the keeping quality of fillets prepared from them.

TARR, H. L. A., AND LANTZ, A. W. *Fish. Res. Bd. Canada Prog. Rep. Pac., No. 81,* 80-3, Dec., 1949.

Bacterial count was greatly reduced by washing. The keeping quality was not improved when an acid phosphate-sodium nitrite solution was used instead of water.

FLAVORS AND FLAVORING

145J. New method of curing vanilla beans.

Amer. Perf., 54, 393, Nov., 1949.

Method of curing produces known moisture content, cuts time of curing, provides ideal conditions for enzymatic development of flavor and gives a product practically free from yeast and molds.

146J. Volatile concentrates now free from tax.

Food Packer, 24, 543 (1949).

Alcohol tax laws changed to permit manufuacture of "essences." This releases the material without the $9 a spirit gallon formerly charged.

FRUIT JUICES

147J. Maine Experiment Station develops frozen apple juice.

Canner, 109, 7, Dec. 31, 1949.

Juice fresh expressed from washed and ground apples is de-aerated and concentrated under vacuum at temperatures slightly above room temperature. The resulting concentrated juice contains approximately 55% total solids and is reduced by addition of sufficient fresh apple juice to reduce the total solids to approximately 42%. The product is then chilled to a slush, filled into cans, and frozen.

MILK AND DAIRY PRODUCTS

148J. The composition and sanitary quality of a product used as whipped cream on ice cream in upstate New York.

DAHLBERG, A. C., AND KOSIKOWSKY, F. V. *J. Milk Food Tech., 12,* 325-31 (1949).

The product used as whipped cream in upstate N. Y. retail stores was collected and studied. It was generally sold as whipped cream, irrespective of its milk fat content. Most of the cream mix was whipped instantaneously by the release of the product from pressure of nitrous oxide gas. A very limited amount of cream mix was whipped by agitation using mechanical beaters or bubbling air. Of the 39 samples collected, 9 contained amounts of milk fat which were below state standards for light cream and only 2 were sufficiently rich to be heavy cream. The average percentages of fat of whipped cream prepared by 3 different devises using nitrous oxide gas were 19.7, 21.5, and 19.2. Cream mix whipped by agitation contained 29.5 percent fat. The fat was pure milk fat. Non-fat milk solids were added to a majority of the cream mixes and nearly all of them contained added sugar and vanilla. The whipped cream prepared by release from nitrous oxide pressure by 3 methods weighed an average of 0.22, 0.19, and 0.28 pound per pint. This means that I pint of cream mix made about 2 quarts of whipped cream. The total bacterial counts and the coliform counts on the whipped creams were high, the majority of average total counts being in the millions per gram. The flavor of some instantly whipped cream was very stale, but when made from fresh bottle cream and milk the flavor was good or excellent. The body of most of the instantly whipped cream was fluffy and of the mechanically whipped cream was good or excellent. Based upon this survey and published research, it was thought that whipped cream of satisfactory characteristics would contain not less than 27% fat and would weigh at least 0.30 pounds per pint.

TRENDS IN FISH PROCESSING

The postwar tendency to market more of the catch as fresh and frozen continued in 1949 with some signs of a recession in the expansion of frozen fish industries.

World production of salted cod and related species in 1949 is unlikely to be much greater than 1948 production. Although France, Portugal, and Spain increased their salted fish production for domestic markets, total landings of cod and related species were smaller in some countries and the quantity used for salted fish production therefore continued to decline. In 1950, however, there are prospects of a sizable expansion due partly to the expansion of the fishing fleet in Iceland and the diversion of more fishing effort from Europe to the Northwest Atlantic grounds. The production of salted winter herring in Norway was high in 1949 but is likely to be much reduced in 1950. The tuna pack in the United States of America may reach a new maximum. — *F. A. O. Fisheries Bull.,* January-February, 1950.

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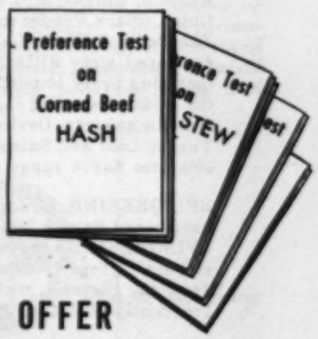

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Selected Abstracts

ANALYTICAL METHODS

149J. A new oxidation method for the determination of saturated fatty acids.

FITELSON, J. *J. Am. Oil Chem. Soc., 27*, 1-8 (1950).

A method for the quantitative determination of the saturated acids in fats has been developed. This method is based upon the non-disruptive oxidation of the unsaturated acids by performic acid, extraction of the oxidized mixture with petroleum ether and, finally, chromatographic purification of the saturated acids. The final residue contains a small quantity of non-acid material, usually 0.1 to 0.7%, based on the total mixed fatty acids. The unsaturation of these saturated acids is equivalent to about 1%, as oleic acid, so that a total absolute correction of about 0.4% must be applied. The method is fairly simple and rapid, requiring about six hours for one determination and can be applied to a wide variety of fats.

150J. Estimation of lipase in dairy products. II. An extraction-titration method for the estimation of bacterial lipase.

LUBERT, D. J., SMITH, L. M., AND THORNTON, H. R. *Canadian J. Res., 27F*, 490-98 (1949).

A method of estimating bacterial lipase is presented that is believed to be more nearly quantitative than any other at present available. The method is based on the titration of acids in an ether extract of a skim milk culture following a 30 min. period of lipase activity at 37° C. It is shown that ether-soluble acids carried into the reaction medium do not interfere with the measurements and that ether-soluble acids are not produced from protein or lactose during the test. The method is applicable over a sufficiently wide pH range to make it generally adaptable in bacteriology.

BIOLOGICAL SCIENCES

BIOCHEMISTRY

151J. The instability of ascorbic acid in water, with added copper or hydrogen peroxide or both.

BELL, R. W., AND MUCHA, T. J. *J. Dairy Sci., 32*, 827-32 (1949).

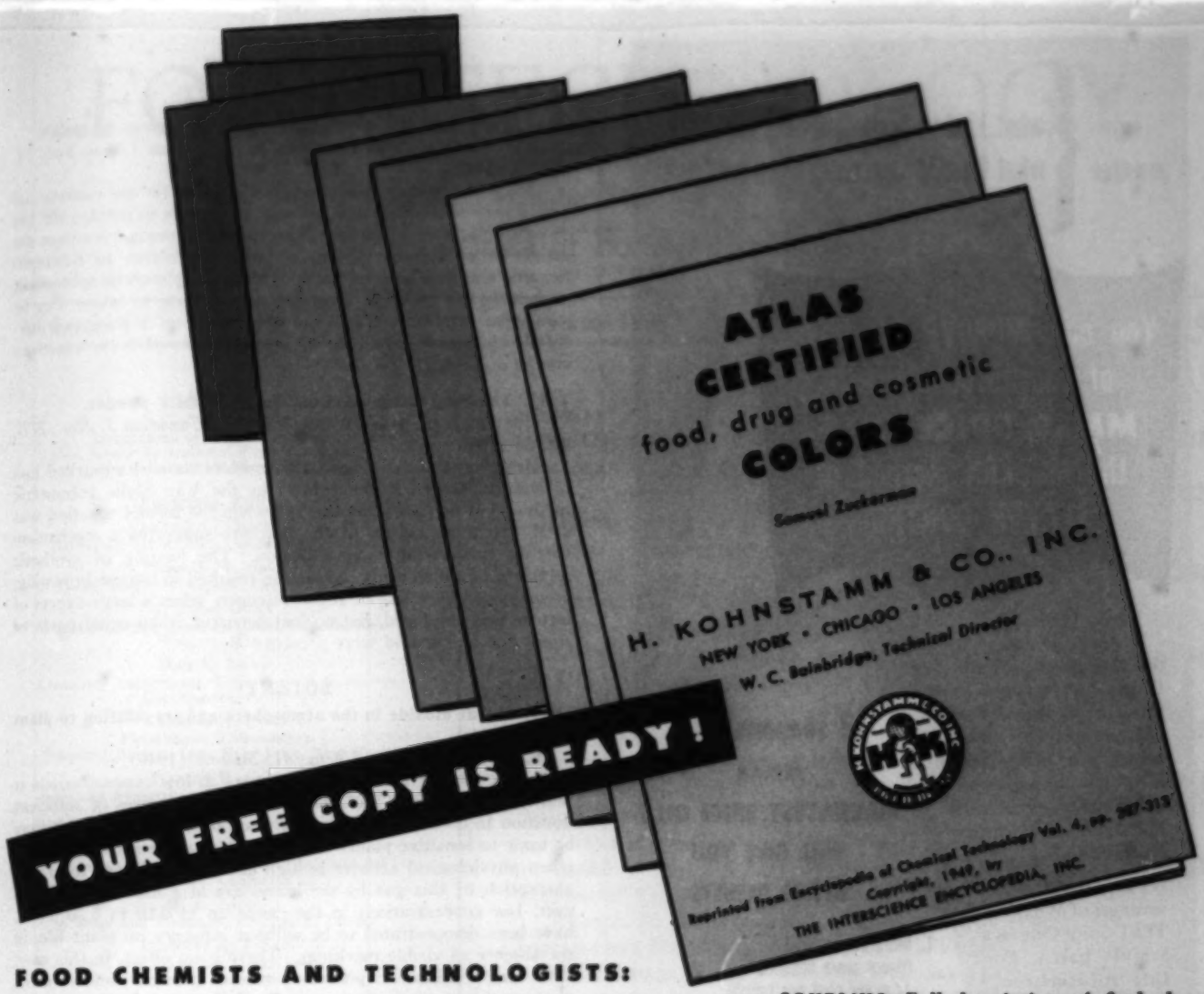
Water may contain impurities that accelerate the oxidation of ascorbic acid. In pyrex glassware—distilled water ascorbic acid is relatively stable, but not in the presence of hydrogen peroxide. It is unstable if copper is present, 0.3 p.p.m. is sufficient to cause rapid oxidation. Only pure water should be used to prepare solutions in standardizing the 2, 6-dichlorophenol-indophenol dye.

152J. Organic sequestering agents.

TREVOR, J. S. *Food, 18*, 345 (1949).

The following applications summarize the most likely ones for ethylene bis-imino-diacetic acid in food processing: 1) Removal of traces of free copper and iron in vegetables and fish. It is known that as little as 3 p.p.m. of copper in corn and peas renders them unsaleable. 2) Removal of traces of free copper and iron from ice-cream ingredients, such as Irish moss (which contains about 0.219 percent iron), egg yolk, locust bean gum, alginates, cocoa, fruits and flavors. It is claimed that these metals tend to develop off-flavor and rancidity. 3) Removal of metallic spray residues from food products. At present this is done quite effectively with polyphosphates and U. S. Patent 2,082,573 describes a current method. The greater stability of aqueous solutions of the organic sequestering agent appears to be of importance. 4) Removal of metallic impurities from gelatin so as to improve its whipping qualities. Traces of copper and iron are extremely difficult to remove from this protein. 5) Bottle-washing when used with alkalis and wetting agents. Here the sequestering agent prevents hardness salts from forming insoluble compounds with milk.

(Continued on page 4)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